

AMENDMENTS TO THE CLAIMS

1-59. (Canceled)

60. (New) A method for vaccinating a mammal against a target antigen, comprising:
introducing into the mammal by disrupting the stratum corneum an effective dose
of the target antigen or an epitope(s) thereof; and

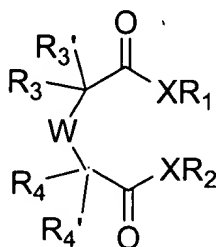
administering to the mammal a topical treatment which in the absence of antigen
is sufficient to increase the number of dendritic cells migrating to a lymphoid organ.

61. (New) The method of Claim 60, wherein the topical treatment comprises a
lipophilic molecule capable of traversing the stratum corneum.

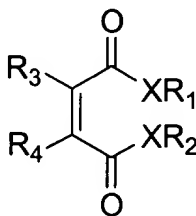
62. (New) The method of Claim 61, wherein the lipophilic molecule is ≤ 500 daltons.

63. (New) The method of Claim 62, wherein the lipophilic molecule is dibutyl
phthalate or camphor.

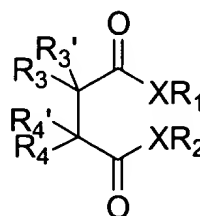
64. (New) The method of Claim 62, wherein the lipophilic molecule is selected from
the following formulas:



(1)



(2)



(3)

wherein R_1 and R_2 are independently alkyl side chains containing 1 to 16 carbon atoms, C_1 to C_{16} substituted alkyl, C_3 to C_{10} cycloalkyl, C_3 to C_{10} substituted cycloalkyl, C_2 to C_{10} alkenyl, C_2 to C_{10} substituted alkenyl, C_2 to C_{10} alkynyl, C_2 to C_{10} substituted alkynyl;

wherein R_3 , R_3' , R_4 and R_4' are selected independently from the group consisting of hydrogen atom, hydroxy group, halogen group, alkyl side chains containing 1 to 16 carbon atoms, C_1 to C_{16} substituted alkyl, C_3 to C_{10} cycloalkyl, C_3 to C_{10} substituted cycloalkyl, C_2 to C_{10} alkenyl, C_2 to C_{10} substituted alkenyl, C_2 to C_{10} alkynyl, C_2 to C_{10}

substituted alkynyl, C₇ to C₁₆ phenylalkyl, C₇ to C₁₆ substituted phenylalkyl, phenyl, substituted phenyl, naphthyl and substituted naphthyl;

wherein X is an oxygen or a nitrogen atom; and

wherein W is a saturated or unsaturated chain consisting of C₁-C₁₀ alkyl, C₁-C₁₀ substituted alkyl, C₇-C₁₀ phenylalkyl, C₇-C₁₆ substituted phenylalkyl, phenyl, substituted phenyl, naphthyl, substituted naphthyl, C₃-C₇ cycloalkyl and C₃-C₇ substituted cycloalkyl group, and wherein each terminus of the chain is bonded to the carbon C(R₃R₃') and C(R₄R₄').

65. (New) The method of Claim 64, wherein W contains one or more heteroatoms selected from the group consisting of nitrogen, sulfur, and oxygen in combination or independently.

66. (New) The method of Claim 64, wherein the R₁ and R₂ groups are identical C₁ to C₆ alkyl moieties.

67. (New) The method of Claim 64, wherein R₁ and R₂ are (CH₂)₃-CH₃.

68. (New) The method of Claim 64, wherein X is an oxygen and R₃ and R₄ are linked to form a ring structure which, including the W chain, comprises a saturated or unsaturated C₃ to C₁₀ cycloalkyl, C₃ to C₁₀ substituted cycloalkyl, C₇ to C₁₆ phenylalkyl, C₇ to C₁₆ substituted phenylalkyl, phenyl, substituted phenyl, naphthyl or substituted naphthyl.

69. (New) The method of Claim 64, wherein X is an oxygen and R₃ and R₄ are linked to form a ring structure which, including the W chain, comprises a saturated or unsaturated C₃ to C₁₀ cycloalkyl, C₃ to C₁₀ substituted cycloalkyl, C₇ to C₁₆ phenylalkyl, C₇ to C₁₆ substituted phenylalkyl, phenyl, substituted phenyl, naphthyl or substituted naphthyl, and wherein the ring structure is an aryl group.

70. (New) The method of Claim 64, wherein the ring structure contains one or more heteroatoms selected from the group consisting of nitrogen, sulfur, and oxygen.

71. (New) The method of Claim 64, wherein the lipophilic molecule is selected from the group consisting of dibutyl phthalate, dibutyl-D-tartrate, N,N-diethyl-toluamide, dibutylfumarate, di(2-ethylhexyl)fumarate, diisooctylmaleate, diethylhexylmaleate, diisooctylfumarate, benzoic acid, bihenylmaleate, dioctylphthalate, dibutylmaleate, dioctylmaleate, dibutylsuccinate, dioctylsuccinate, dinonylphthalate, diisononylphthalate,

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dimethylphthalate, diethylphthalate, dipropylphthalate, diphenylphthalate, dibenzylbutylphthalate, and diethylmethylphthalate.

72. (New) The method of Claim 61, wherein the lipophilic molecule comprises a terpene.

73. (New) The method of Claim 61, wherein the lipophilic molecule has an oil/water partition coefficient >1 .

74. (New) The method of Claim 61, wherein the lipophilic molecule has an oil/water partition coefficient of between about 10 and about 10^6 .

75. (New) The method of Claim 60, wherein the topical treatment further comprises an organic solvent.

76. (New) The method of Claim 75, wherein the organic solvent is acetone.

77. (New) The method of Claim 60, wherein the topical treatment comprises ultrasound.

78. (New) The method of Claim 60, wherein the introducing step further comprises transferring cells comprising the target antigen or epitope(s) thereof.

79. (New) The method of Claim 78, wherein the target antigen is selected from the group consisting of a virus, a bacterium, a fungus, and a parasite.

80. (New) The method of Claim 60, wherein the introducing step further comprises injecting the target antigen or epitope(s) thereof.

81. (New) The method of Claim 80, wherein the injection is made via a route selected from the group consisting of intraepidermal, intradermal, subcutaneous, intramuscular, intravascular, or into a specific organ.

82. (New) The method of Claim 60, wherein the topical treatment further increases the number of target antigen-bearing dendritic cells in the lymphoid organ by a factor of about 2 to about 1000 times the number of resident dendritic cells in an untreated mammal.

83. (New) The method of Claim 82, wherein the number of target antigen-bearing dendritic cells in the lymphoid organ is increased by a factor of about 5 to about 100 times.

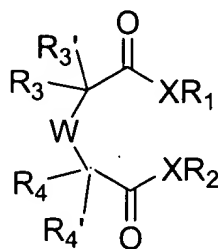
84. (New) The method of Claim 60, wherein the target antigen is a tumor antigen.

85. (New) A method for vaccinating a mammal against a target antigen, comprising:

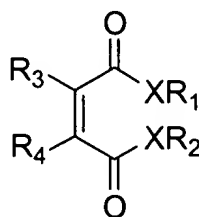
introducing into the mammal by disrupting the stratum corneum an effective dose of the target antigen or an epitope(s) thereof; and

administering to the mammal a topical treatment which in the absence of antigen is sufficient to increase the number of dendritic cells migrating to a lymphoid organ,

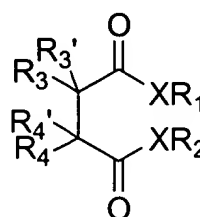
wherein the topical treatment comprises a lipophilic molecule selected from the following formulas:



(1)



(2)



(3)

wherein R_1 and R_2 are independently alkyl side chains containing 1 to 16 carbon atoms, C_1 to C_{16} substituted alkyl, C_3 to C_{10} cycloalkyl, C_3 to C_{10} substituted cycloalkyl, C_2 to C_{10} alkenyl, C_2 to C_{10} substituted alkenyl, C_2 to C_{10} alkynyl, C_2 to C_{10} substituted alkynyl;

wherein R_3 , R_3' , R_4 and R_4' are selected independently from the group consisting of hydrogen atom, hydroxy group, halogen group, alkyl side chains containing 1 to 16 carbon atoms, C_1 to C_{16} substituted alkyl, C_3 to C_{10} cycloalkyl, C_3 to C_{10} substituted cycloalkyl, C_2 to C_{10} alkenyl, C_2 to C_{10} substituted alkenyl, C_2 to C_{10} alkynyl, C_2 to C_{10} substituted alkynyl, C_7 to C_{16} phenylalkyl, C_7 to C_{16} substituted phenylalkyl, phenyl, substituted phenyl, naphthyl and substituted naphthyl;

wherein X is an oxygen or a nitrogen atom; and

wherein W is a saturated or unsaturated chain consisting of C_1 - C_{10} alkyl, C_1 - C_{10} substituted alkyl, C_7 - C_{10} phenylalkyl, C_7 - C_{16} substituted phenylalkyl, phenyl, substituted phenyl, naphthyl, substituted naphthyl, C_3 - C_7 cycloalkyl and C_3 - C_7 substituted cycloalkyl group, and wherein each terminus of the chain is bonded to the carbon $C(R_3R_3')$ and $C(R_4R_4')$.